GEOLOGIC AND MINERAL AND WATER RESOURCES INVESTIGATIONS IN WESTERN COLORADO, USING SKYLAB EREP DATA

Monthly Progress Report

September 1973

EREP Investigation 380

Contract NAS-13394

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Submitted to:

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INTRODUCTION

The primary objective of the CSM Skylab Program is to analyze EREP data for geologic information. To this end, the research has been subdivided into the following tasks;

Task I. The PI shall assist NASA/MSC in mission planning activities related to the proposed investigation.

Task II. The investigator will screen all EREP data obtained over Colorado and will select frames for detailed study.

Task III. The investigator will prepare photogeologic maps using selected S-190 photographs, and will analyze them to determine what geologic information may be contained in them.

Task IV. The geological interpretations obtained in Task 3 will be compared to interpretations obtained from S-192 imagery, and to interpretations made from ERTS-I imagery.

Task V. The geological interpretations will be verified by means of interpretation of aerial photographs, published geological reports, and field observations.

Task VI. The investigator will prepare recommendations for the optimum type, scale, and resolution of imagery to be used for studies of regional geology and exploration for mineral deposits and water resources.

PROGRESS

Overall Status

With this report, Milestones 1 through 4 and 7 have been achieved. The project is behind schedule because of lack of data (see "Outlook and Recommendations").

Past Month's Activities

Activity during September was directed to compilation from published and other available information of a 1:250,000 scale geologic map of the Bonanza test site.

Concurrent research was oriented toward a more detailed study within the above area, with two objectives: 1) Geologic map and report on the Bonanza Project's Regional Geology Test Site (RGTS) and 2) development of a program for obtaining a semi-quantitative (a) evaluation of Skylab/EREP data and (b) comparison of Skylab/EREP data with aircraft and ERTS-1 data for geologic applications. The geologic map and report on the RGTS should be completed during the next reporting period. The comparison and evaluation program has been outlined and data collection should begin during the next reporting period, however, this is dependent on the arrival of SL-2 and SL-3 data from NASA/JSC.

Seven man days were spent taking observations of the regional geologic fractures of the southern Front Range at the intersection of Skylab tracks 30 and 48. Also, two large data sets of ground fracture observations were acquired from private sources. Interpretation of high-altitude photography for EREP evaluation continued.

During the month of September, the data received to date from Skylab 2 were indexed and filed.

Preliminary examinations were begun of the contact photographs from the Skylab 2 S190A and S190B. Detailed interpretations of both types of photography are awaiting the receipt of enlargements suitable for producing overlays. Color additive viewing of S190A

will also await receipt of dupe negatives so that positive/negative color additive viewing can be performed.

Site selection procedures have been initiated for follow-on intensive interpretation, but the lack of data, or at the least, a lack of certainty as to what good-quality data were acquired, hampers this.

Planned Activities for Current Month

Plans for October are to continue the Bonanza geologic map compilation, the preliminary examination of new Skylab photographs, and to select a suitable test site for geologic evaluation of Skylab photographs.

During October, the geologic map and report of the RGTS will be completed and data will be collected for the comparison/evaluation program. A computer program will be developed to analyze the comparison/evaluation data and to organize the data for future study.

Interpretation of Skylab imagery will begin following receipt of useful products, and data will be analyzed for its resolution, discrimination, and indentification capabilities.

Preparation of fracture data sets for computer analysis will begin.

Travel

Seven man days were spent in the field in the southern Front Range in September.

Anticipated travel during October consists of one trip by the PI to NASA/JSC for Skylab data screening.

Outlook and Recommendations

As anticipated in the last report, Milestones 5 and 6 were not achieved because of lack of receipt of data. Based on recent contacts with PIMO, it is probable that these objectives will

not be met in October either. The effect of the delays in receiving data, of course, will be even more far-reaching in terms of our over-all objectives.

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